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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/749,191	12/26/2000	Kashmir S. Sahota	E0520CIP	6191

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Advanced Micro Devices, Inc.
Technology Law Dept. M/S 68
One AMD Place
P.O. Box 3453
Sunnyvale,, CA 94088-3453

EXAMINER
UMEZ ERONINI, LYNETTE T

ART UNIT	PAPER NUMBER
1765	8

DATE MAILED: 02/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-8

Office Action Summary	Application No. 09/749,191	Applicant(s) SAHOTA ET AL.	
	Examiner Lynette T. Umez-Eronini	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-73* is/are pending in the application.

4a) Of the above claim(s) *1-55 and 62* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *56-61 and 63-73* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-55 and 62* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of claims 56-73 in Paper No. 6 is acknowledged. The traversal is on the ground(s) that the slurry can be used only with the claimed method. This is not found persuasive because in the instant case the product (slurry) as claimed can be used in a materially different process of using that product, such as polishing a non-metallic semiconductor surface.

The requirement is still deemed proper and is therefore made FINAL.

2. During a telephone conversation with Deborah W. Wenocur on 12/13/01 a provisional election was made with traverse to prosecute the invention of Group II, claims 56-61 and 63-73 and not claim 62. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-55 and 62 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

3. Claim 63 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 63 is dependent upon non-elected claim 62.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 56 is rejected under 35 U.S.C. 102(b) as being anticipated by Uzoh et al. (US 5,807,165).

Uzoh teaches a method of planarizing a semiconductor wafer that has a SiO2 insulator layer **16,** a Cu layer **SL** and a Ta metal line layer **LL** (column 1, lines 33-42; column 5, lines 33-37; and Figure **6**). The method includes using a CMP apparatus **60**, which includes a rotatable polishing platen **62** attached to a rotatable shaft **68,** a polishing pad **64** mounted to the platen **62,** a means for urging the carrier **66** against the pad **64,** and a polishing slurry supply system in fluid communication with the pad **64**. The supply system includes a container **70** coupled to a conduit 72 arranged and dimensioned for dispensing polishing slurry **74** onto the pad **64** (column 5, lines 41-54 and Figures **7-10**). The polishing slurry containing silica abrasive, water (DI water), 7% by volume benzotriazole (same as applicant's copper passivation agent) and a nonionic surfactant such as Alkanol (which is the trade mark for a series of fatty alcohol-ethylene oxide condensation products and is the same applicant's polyethylene oxide surfactant), (column 4, lines 56-62). Using Uzoh's polishing slurry and method to polish the same materials as that of the claimed invention would inherently result in said polishing

occurring for a total polishing period of time and said wafer would be removed from against said platen upon completion of the polishing process.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 57-61 rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh et al. (US 5,807,165) as applied to claim 56 above.

Uzoh differs in failing to teach the concentrations of the slurry containing 1.54 wt% 1,2,4-triazole; 0.5 wt% PEG-10,000; 93.6 wt% silica suspension containing 13.6 wt% SiO2; and 4.33 wt% DI water, **in claim 61.**

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to employ any of a variety of operational variables such as the concentrations of the polishing slurry, including the concentrations as claimed by the applicant. Concentration is a known variable in the polishing art and known to affect both the rate and quality of the polishing process. Hence, conducting routine experimentation for the purpose of reducing damage to the workpiece would optimize the selection of particular values for these variables. Changes in temperature, concentrations, or other process conditions of an old process do not impart patentability

unless the recited ranges are critical, i.e., they produce a new and unexpected result. *In re Aller et al.*, 105 USPQ 233.

8. Claim 63 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh ('165).

Uzoh teaches all of the limitations of claim 56 above.

Uzoh differs in failing to teach decreasing the flow of said polishing slurry prior to said step of removing said wafer from against said platen; and flowing the polishing additive solution onto the platen for a second period of time while inducing relative motion between said wafer and said platen and maintaining a force between said platen and said wafer.

It is known in the art that the polishing rate varies with the flow rate of the polishing slurry and that abrasive material in the polishing slurry scratches the surface to be polished. Hence, it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to vary the flow rate by decreasing said flow of said polishing and flowing a polishing additive solution onto a platen for a second period of time while inducing relative motion between said wafer and said platen and maintaining a force between said platen and said wafer for the purpose of minimizing scratches on the wafer relative to the loading rate of the slurry.

9. Claims 64-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uzoh ('165) as applied to claim 63 above.

Uzoh differs in failing to teach the concentrations of the polishing additive comprises 2.0-3.0 wt% 1,2,4-triazole; 0.1 – 2.0 wt% PEG-10,000; and DI water, **in claims 69 and 73;** and 0.5 –2.0 psi down force of 5-30 second in a post-CMP buff step, **in claim 73,** and decreasing the flow rate of polishing slurry to zero, **in claims 64 and 71**.

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to employ any of a variety of operational variables such as the concentration and flow rate of the polishing slurry and the pressure and time used in a post-CMP buff step, and the operational variables as claimed by the applicant. Concentration, pressure, and processing time are known variable in the polishing art and known to affect both the rate and quality of the polishing process. Hence, conducting routine experimentation for the purpose of reducing damage to the workpiece would optimize the selection of particular values for these variables. Changes in temperature, concentrations, or other process conditions of an old process do not impart patentability unless the recited ranges are critical, i.e., they produce a new and unexpected result. *In re Aller et al.*, 105 USPQ 233.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 703-306-9074. The examiner can normally be reached on Second Friday.

ltue
February 25, 2002

BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700